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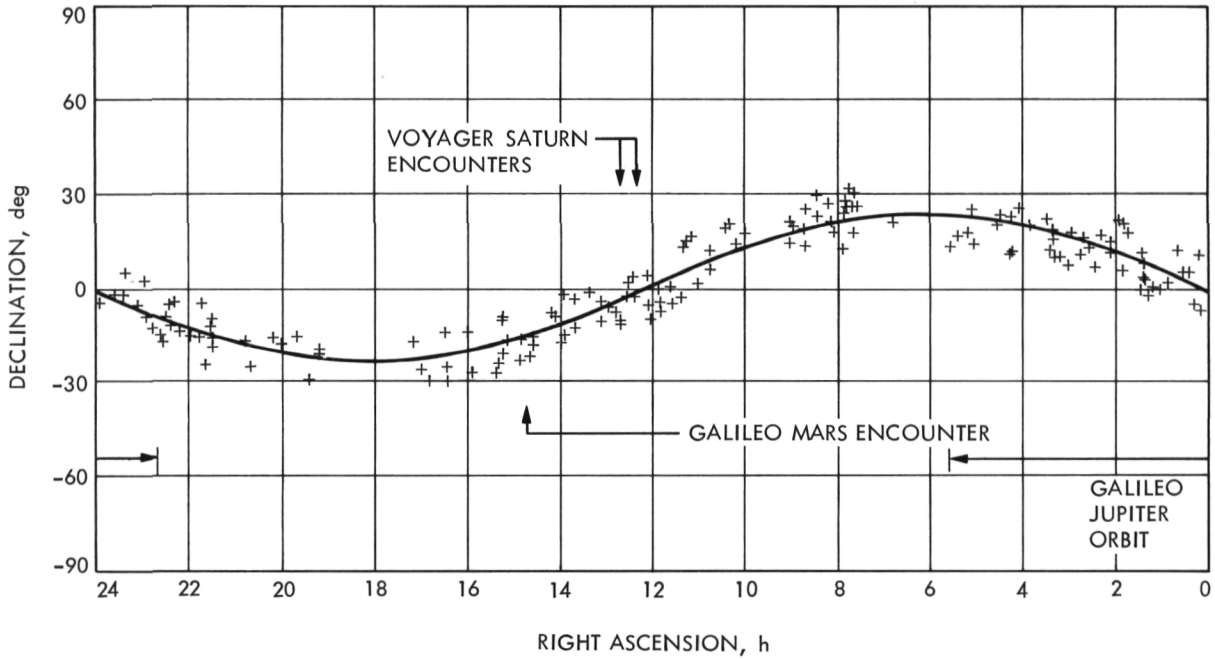
RADIO SOURCE CATALOGS

To support its missions in geodesy and spacecraft navigation, JPL has developed several radio astrometric catalogs. One catalog consists of 170 quasar locations, all lying within a few degrees of the ecliptic plane, the plane in which most of our solar system lies. These radio sources all emit energy greater than 0.1 Jansky at S-band microwave frequencies. The positions of these sources are being determined to an accuracy of 0.01 arc seconds.

Catalogs such as this are one of the keys to a new form of spacecraft navigation, differential very long baseline interferometry (delta VLBI). The technique of cross-correlating signals received at deep space stations separated by intercontinental distances yields spacecraft angular position with respect to these catalogued quasars. This catalog of ecliptic quasars is for use by Voyager during encounter with Saturn. It is also intended for use by Galileo, both at Mars encounter and during insertion into Jovian orbit.

Another of the catalogs consists of 109 radio sources uniformly distributed over the entire sky. The relative positions of these sources are known to an accuracy of at least 0.01 arc second. This catalog, believed superior to any other radio catalog of its kind in the world, lists objects at the very edges of the visible universe.



This plot describes the locations of 170 catalogued quasars near the ecliptic plane. Their precise locations are for use in the navigation of the Voyager spacecraft at their encounters with Saturn and for Galileo at both Mars and Jupiter.